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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,166	09/08/2003	Wolfgang Albrecht	NI 156	1545

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EXAMINER

FORTUNA, ANA M

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 07/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,166

Applicant(s)

ALBRECHT ET AL.

Examiner

Ana M. Fortuna

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 1-5, 7, 9, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is unclear as to whether "a body" (material), or "a membrane" made of polyimide, is intended, the term "particularly a polyimide membrane" renders the claims indefinite.

Claim 7 is unclear regarding the comparison of pore size to the modifier substance.

The claim is unclear as to whether the molecular weight cutoff of the membrane and the molecular weight of the modifier substance are intended.

Claim 9 is redundant with regards to the polyimide membrane.

2. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte*

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Hasche, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitation polyimide body, and the claim also recites polyimide membrane, which is the narrower statement of the range/limitation.

Claim 4, recites the broad recitation 0.1 to 20 %, and the claim also recites 1 to 10 %, which is the narrower statement of the range limitation.

Claim Objections

3. Claim 11 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim 11 not been further treated on the merits.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 3, 4, 5, 6, 8, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Friesen et al (US Patent 5,753,008)(hereinafter Patent '008). Patent '008 discloses a composite membrane includes a support and a selective coating for the composite, e.g. hollow fibers(column 2, lines 25-42). The support is selected as a polyimide membrane (column 4, lines 48-55). Regarding claims 6, 9, asymmetric microporous polyimide support is disclosed in Patent '008 (column 5, lines 30-44). The coating is selected to be hydrophilic and selected from polyamines, e.g. modifier

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(column 6, lines 7-12). The coating solution is formed from a solution containing water and polyethyleneimine (PEI) and water (column 8, lines 24-26)

Patent '008 also discloses contacting the coating solution for about 1 minute with the support (column 8, lines 38-50), The membrane of patent '008 is further heated, cleaned and dried, e.g. by the action of passing nitrogen into the lumen of the hollow fibers at 80 degree C. As to claims 1 and 5, the PEI meets the modifier requirements. Regarding claims 2-3, the temperature treatment at 80 degree C, as disclosed in the patent above is within the claimed ranges.

As to claim 4, the modifier concentration is also disclosed (column 8, lines 24-126).

Regarding claim 8, Patent '008 discloses methods for applying the coating of the modifier solution to the support, and further disclose its application to the inside or to the outside to the base membrane (column 6, last paragraph, bridging with column 7, lines 1-3), which teach the application of the coating at the side of the smaller pore size or at the larger pore size (support layer) of the support "asymmetrical membrane".

6. Claims 1- 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Linder et al (5,049,282)(hereinafter Patent '282). Patent '282 discloses the membrane including a support and a layer of polyamine compound, the support can be selected to be a polyimide support (column 2, lines 51-60), and the polyamine can be formed from primary , secondary amines, etc. (column 4, lines 14-63). The layer formation or modifier treatment including heating is also disclosed (column 3, liens 40-63). The percentage of the modifier, e.g. amine is suggested, and the time and temperature conditions are also disclosed (column 10, lines 49-68, column 12, lines 22-36).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friensen et al (Patent '008), as applied to claim 1 above and optionally in view of applicant's disclosure. Patent '008 fails to disclose pore size formation on its active layer, e.g. layer formed by the modifier (or polyamine layer), however, based on the layer formation in which the solution contains water and is formed in presence of alcohol and crosslinking agent, one skilled in the art at the time the invention was made can expect pore formation, since both agents (water and alcohols), are pore formers. As to claim 10, Patent '008 discloses the support as limited only by their permeability and solvent resistance (column 4, lines 47-59). Applicant discloses the polyimide membrane support as known in the art (specification, page 11, third paragraph). It would have been obvious to one skilled in the art at the time the invention was made to use a membrane having the properties claimed in claim 10, and available in the market, as recognized by the Applicant, as support for the membrane of 'patent '008, based on the inherent polyimide membrane properties, when made from a spinning solution resulting in an asymmetrical membrane.

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9. Claim 1, 4, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tseng et al (5,433,852)(hereinafter Patent '852) or Reale, Jr. (5,085,778)(hereinafter '778). Patent '852 discloses functionalized hydrophobic membrane, e.g. PVC, by treating with a solution containing a polyamine., and treating the membrane at high temperature (abstract, column 3, lines 5-60), the time of contact, the amine percentages or claim 4 are also disclosed (column 3, third paragraph, column 4, example 1). The treatment is performed on a PVC membrane (hydrophobic), however, other hydrophobic membranes are suggested, including polyimide (column 1, lines 4-21). It would have been obvious to one skilled in the art at the time the invention was made to modify the surface of a conventional porous membrane made of polyimide by the treatment suggested in '852, e.g. to mad the membrane water permeable and increase membrane flux.

Reference '778 is cumulative as teaching the same type of coating to form a composite membrane on a PAN, or other hydrophobic polymers, such as, polysulfone (column 10, claims). The later reference suggested the polyamine treatment as suitable for modifying other hydrophobic support membrane structures.

Conclusion

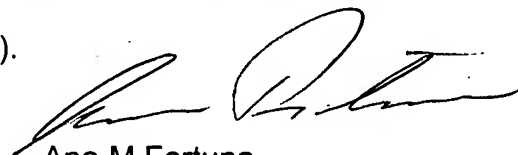
10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Additional prior art teaches providing amine layer on different membrane supports by different methods, including crosslinking by a solvent, or other methods, polyimide membranes are disclosed as conventional porous support, and equivalent to polysulfone PVC, etc.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M. Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ana M Fortuna
Primary Examiner
Art Unit 1723

AF
July 06, 2005